PERSPECTIVES: MARK SKOLNICK, MYRIAD GENETICS
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Mark Skolnick is one of that rare breed in Utah, a successful conceiver and founder of a biotechnology company with a current market value estimated in the hundreds of millions of dollars. Skolnick was one of the original team responsible for establishing Myriad Genetics, a company founded to develop diagnostic tests for genetic disorders. Along the way, research at the company has led to the discovery of a number of new genetic markers for conditions including breast cancer susceptibility.

Myriad itself has continued to grow and evolve and has expanded into both the pharmaceuticals and proteomics fields. Wasatch Digital iQ wanted to know more about the man with his finger on the pulse of the genetic diagnostic testing field.

In addition to his experience with Myriad, Skolnick recently founded TheraDoc, a startup that develops software that provides decision-making support for medical professionals in clinical settings.

Digital iQ: What was your background, and what brought you to Utah?

Mark Skolnick: By training, I am a population geneticist. I went to Stanford University but did my thesis in Pavia, Italy, working with the famous population geneticist Luigi Cavalli-Sforza to reconstruct the genealogies from Italian parents' registries. Through these records, we could look at patterns of migration and fertility on gene flow and do population studies.

While I was there, three gentlemen from the Genealogy Society of Utah came to work with one of the other researchers in our group. They were documenting parish registers and household census reports for the whole Diocese of Parma, going back to the 15th century! When I saw the enormity and ambitiousness of their work, I realized that to continue my work in genealogical population genetics, Salt Lake was obviously the place for me to be: "this is the place" for that kind of work.

Once I arrived here, I proposed a rather ambitious project, to construct a genealogy of Utah from the family group sheets that had been collected by the Utah Genealogical Society. It was very similar to my work in Italy. Utah already had three-generation family group sheets. We collected them, and compiled the data from 200,000 records. From this database we hoped to be able to track patterns of disease occurrence in the Utah population.

I worked with Charlie Smart, who was the creator and organizer of the Utah Cancer Registry. We linked the cancer registry to the database and did the first and only population-based study of the increased kinship amongst cases of cancer. We found that certain cancers showed patterns of familial clustering. All this was at a time before oncogenes and tumor suppressors were even known--in fact before people recognized that there was a genetic basis for cancer. What we were doing was revolutionary.

After that, our objective was to try to map these genes on the DNA. We set about mapping different genetic diseases, to understand the genetic basis of cancer.

DIQ: How did Myriad Genetics come about?

MS: I had been thinking for a couple of years about doing something commercial with genetics, but I hadn't come up with anything that could result in a company. Then a race began to clone the gene associated with a breast cancer susceptibility marker on human chromosome 17.

I recognized this to be the opportunity I had been waiting for: it was worth founding a company to pursue this, because if we could find this gene, then we could create a diagnostic product to detect it; and this would be an important contribution to humankind. It seemed like a high-risk bet for investors, but with a great pay-off if it worked. Myriad won the chromosome 17 race, and that was what launched the company.

Myriad was the very first genomics company, and I am kind of proud to have been involved in that. We have found a number of genes for breast and ovarian cancers, prostate cancer, heart disease, and diabetes; and we are looking for other genes involved in depression, asthma, osteoporosis, and obesity. Those are a lot of common and important diseases.

Once we started finding genes, we wanted to know what they did; and in addition to diagnostics, we started looking at their biology and thinking of them as potential drug targets. That has led to the growth and evolution of Myriad as a company. In just 10 years it has changed from a gene finding company to the analysis of proteins and doing whole genome studies like we have done with rice. This gives important clues to comparative genomics, which greatly assists our understanding of human beings.

DIQ: You seem to take a very broad view and employ a wide range of approaches in your study of genetics. How is this reflected in your management style?

MS: It's true we draw on skills from academia, business and business processes, product commercialization, and from government and public policy. In addition, there are a lot of scientific areas, including computer science, epidemiology, statistics, molecular biology, drug delivery, and so on.

My role in the research and commercial environments is not to be the person who knows how to do any one task the best. I think my skill is being able to understand the broader picture and being able to find people who are very skilled in individual areas. I bring together molecular biologists and mathematicians, and computer scientists and health care professionals to attack problems that are very complex. We are all constantly learning new disciplines from one another.

One result is that we end up with very interesting interpersonal issues; that is bound to happen whenever you get a lot of bright people together from different areas. There's not a lot of turf fighting and egos, just different points of view; and that's the strength but also a source of complexity. My role is to try to put the pieces together and to keep them on track and to see that the different interests are always met.

DIQ: Do you think these challenges are unique to Myriad?

MS: We are in an era of social change, of huge changes in our understanding of biology, and in our ability to translate that into products that help society. I think we are seeing the end of the Industrial Era and the expansion of the Information Era; this has been going on for the last couple of decades.

Some of the problems that we presently face, such as bio-terrorism, are the result of "holes" left in the fabric of society, holdovers from the Industrial Era. We are going to have to buckle down and straighten things out so that we can close one chapter and move society into the new Information Era. And I think that that is part of what is going on. Our company itself is a part of a force for social change. This has been an underlying interest in all my research, to actually do something important for humankind.

DIQ: Does the Myriad Genetics of today look like the company you envisioned when you founded it 10 years ago?

MS: No it doesn't. A person can dream of certain things, but you can't predict them. In my case, I wasn't even dreaming of a particular outcome; I was addressing a specific problem. I was driven very much to continue my career in cancer genetics to find cancer genes. This was a compulsion, an obsession. That's what drives scientists; you have to be compulsive and obsessive to get significant things done.

Myriad started as a novel but risky idea, which involved leaving the warm embrace of academia for an adventure in the commercial world. Once I had taken that step, the rest was event-driven. We found the breast cancer gene, and we confronted the challenge of the technology involved in creating a diagnostic product. The next challenge was to understand the gene products, the proteins and the protein-protein interactions. We developed the appropriate technology and realized that it had commercial potential. Now we are also a pharmaceutical company and are developing proteomics technologies. We are going to continue evolving.

DIQ: Are there aspects of a business approach to genetics research and commercialization in a corporate setting that are different from an academic one?

MS: In academia I would have to compete with my colleagues in my department for resources, for space, for students, and for credit. There is constant turf fighting that is built into the system because of the competitive nature to get funds from NIH. I would have to get credit for my work by having my name appear first or last on a research paper.

In the corporate setting, everybody pulls together and forces are exerted in the same direction. One thing that creates this unity is the stock option. At Myriad, the company gets the credit, and people are happy with that because their stock options go up. There is a lot of internal reinforcement within the company that allows people to get credit for their work, and this validates peoples' careers. Our scientists might not have a huge list of publications, but they will have a small list of exceptional publications. And you can go from that environment back to academia.

In addition, at Myriad we are able to do projects on a scale that can't be matched in academia because of the cooperative nature of teams that you can build, the dime that you can turn on, the speed with which you can garner your forces to move in a different direction as opportunity arises, and the resources you can rapidly apply to achieve objectives.

The corporate setting has turned out to be a very dynamic environment inside which lots of people can express themselves, accomplish things, and make important contributions to society. You are constantly looking for new ways to evolve, yet you are able to satisfy personal goals.

DIQ: With the success of Myriad, you now have an industry track record. You are a business scientist now. How has that process changed you as a person?

MS: When I first got involved with Myriad, I was an academic. I was thinking about having to publish everything right away. I have had to change my mindset and my philosophy about how I judge myself, how I seek ego gratification and recognition. That has been the biggest change.

DIQ: Let's shift gears and talk about economic development in Utah. What do you think should be done to create an environment favorable to biotechnology?

MS: There is a tendency for a particular locale to look around and see what is being done elsewhere, then to try to imitate that. You see what is happening and you say, "Well, let's do some of that here." I don't think that that attitude works. I believe in fundamental ideas: if you are an innovator, you have to come up with something new.

It may sound obvious, but if you want to be an innovator, you have to have an original idea. You have to create the next wave, and the next wave. That's often not the way that it is approached. People try to set up entrepreneurial companies that are really not new, that catch existing waves or, unfortunately, the back end of a previous wave. We have to encourage novel products and novel ideas.

We now have an opportunity in Utah to make a big investment and become a major player. All of the technologies we are seeing are just at the beginning. We are in a situation similar to the beginning of the last century, at the beginning of electricity and aviation, and we are still learning how to exploit those properly. Now the comparable industries are telecommunications, biology, medicine, and all of the information sciences. This is all frontier. If you think we are going to be mean and lean and clever and grow economically with our brains and not with money, that's silly; we are not that much smarter than everybody else.

To create an environment that supports technology, we need more than lip service from the state government. They have to make major investments if we are going to establish industry here. They need to set aside land, give tax breaks, and attract maturing industries, mature industries, and entrepreneurial industries to create a core. They have to support the educational system, attract people from outside, and retain those we have educated here. Government will not decide which industries are going to emerge or thrive, but they should create a fertile environment and allow things to just bubble up.

Utah is a great state, a great place to live. Myriad has not had trouble attracting top scientists to come here. People respect and want a good quality of life and you get that in Utah. iQ